

Администрирование сетевых подсистем

Лабораторная работа №6

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Цели и задачи

Изучение установки, конфигурирования и базового администрирования СУБД MariaDB, включая создание баз данных, управление пользователями и выполнение резервного копирования.

Установка и конфигурация MariaDB

Установка пакетов MariaDB

```
Installed:
mariadb-3:10.11.11-1.el10.x86_64
mariadb-client-utils-3:10.11.11-1.el10.x86_64
mariadb-errmsg-3:10.11.11-1.el10.noarch
mariadb-server-3:10.11.11-1.el10.x86_64
mysql-selinux-1.0.14-1.el10_0.noarch
perl-Sys-Hostname-1.25-512.2.el10_0.x86_64
mariadb-backup-3:10.11.11-1.el10.x86_64
mariadb-common-3:10.11.11-1.el10.noarch
mariadb-gssapi-server-3:10.11.11-1.el10.x86_64
mariadb-server-utils-3:10.11.11-1.el10.x86_64
perl-DBD-MariaDB-1.23-10.el10.x86_64

Complete!
[root@server.dgavdadaev.net ~]# ls /etc/my.cnf.d/
auth_gssapi.cnf  enable_encryption.preset  mysql-clients.cnf  provider_lz4.cnf  provider_snappy.cnf
client.cnf      mariadb-server.cnf        provider_bzip2.cnf  provider_lzo.cnf  spider.cnf
[root@server.dgavdadaev.net ~]# cat /etc/my.cnf
#
# This group is read both both by the client and the server
# use it for options that affect everything
#
[client-server]

#
# include all files from the config directory
#
!includedir /etc/my.cnf.d

[root@server.dgavdadaev.net ~]#
```

Рис. 1: Установка MariaDB

Просмотр конфигурационных файлов

```
[root@server.dgavdadaev.net ~]#  
[root@server.dgavdadaev.net ~]# systemctl start mariadb  
[root@server.dgavdadaev.net ~]# systemctl enable mariadb  
Created symlink '/etc/systemd/system/mysql.service' → '/usr/lib/systemd/system/mariadb.service'.  
Created symlink '/etc/systemd/system/mysqld.service' → '/usr/lib/systemd/system/mariadb.service'.  
Created symlink '/etc/systemd/system/multi-user.target.wants/mariadb.service' → '/usr/lib/systemd/system/mariadb.service'.  
[root@server.dgavdadaev.net ~]# ss -tulpen maria  
Error: an inet prefix is expected rather than "maria".  
Cannot parse dst/src address.  
[root@server.dgavdadaev.net ~]# ss -tulpen | grep maria  
tcp    LISTEN 0      80          0.0.0.0:3306      0.0.0.0:*        users:((("mariadb",pid=17045,fd=18))  
                                              uid:27 ino:65760 sk:13 cgroup:/system.s  
lice/mariadb.service <->  
tcp    LISTEN 0      80          :::3306          :::*              users:((("mariadb",pid=17045,fd=19))  
                                              uid:27 ino:65761 sk:1f cgroup:/system.s  
lice/mariadb.service v6only:1 <->  
[root@server.dgavdadaev.net ~]#
```

Рис. 2: Конфигурация MariaDB

Remove anonymous users? [Y/n]

... Success!

Normally, root should only be allowed to connect from 'localhost'. This ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n]

... Success!

By default, MariaDB comes with a database named 'test' that anyone can access. This is also intended only for testing, and should be removed before moving into a production environment.

Remove test database and access to it? [Y/n]

- Dropping test database...

... Success!

- Removing privileges on test database...

... Success!

Reloading the privilege tables will ensure that all changes made so far will take effect immediately.

Reload privilege tables now? [Y/n]

... Success!

Cleaning up...

All done! If you've completed all of the above steps, your MariaDB installation should now be secure.

Thanks for using MariaDB!

[root@server.dgavdadaev.net ~]#

Базовая настройка MariaDB

List of all client commands:

Note that all text commands must be first on line and end with ';'.

```
?      (\?) Synonym for 'help'.
charset (\C) Switch to another charset. Might be needed for processing binlog with multi-byte charsets.
clear   (\c) Clear the current input statement.
connect (\r) Reconnect to the server. Optional arguments are db and host.
delimiter (\d) Set statement delimiter.
edit    (\e) Edit command with $EDITOR.
ego     (\G) Send command to MariaDB server, display result vertically.
exit    (\q) Exit mysql. Same as quit.
go      (\g) Send command to MariaDB server.
help    (\h) Display this help.
nopager (\n) Disable pager, print to stdout.
notee   (\t) Don't write into outfile.
nowarning (\w) Don't show warnings after every statement.
pager   (\P) Set PAGER [to_pager]. Print the query results via PAGER.
print   (\p) Print current command.
prompt  (\R) Change your mysql prompt.
quit    (\q) Quit mysql.
rehash  (\#) Rebuild completion hash.
sandbox (\-) Disallow commands that access the file system (except \P without an argument and \e).
source  (\.) Execute an SQL script file. Takes a file name as an argument.
status  (\s) Get status information from the server.
system  (\!) Execute a system shell command.
tee     (\T) Set outfile [to_outfile]. Append everything into given outfile.
use     (\u) Use another database. Takes database name as argument.
warnings (\W) Show warnings after every statement.
```

For server side help, type 'help contents'

```
MariaDB [(none)]> SHOW DATABASES;
```

```
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
```

Просмотр команд и системных баз

```
MariaDB [(none)]> status
-----
mysql Ver 15.1 Distrib 10.11.11-MariaDB, for Linux (x86_64) using EditLine wrapper

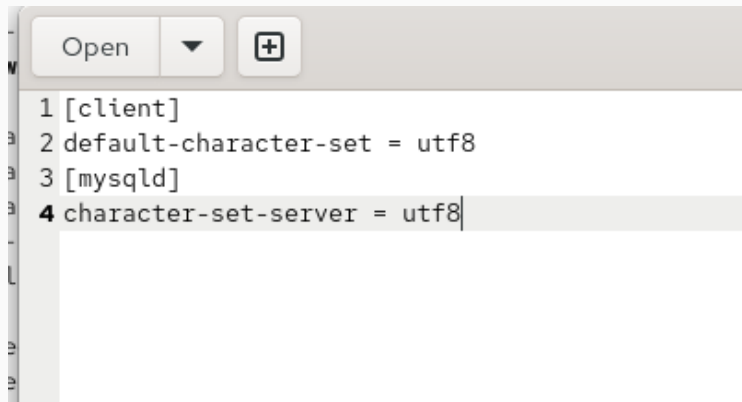
Connection id:          13
Current database:
Current user:           root@localhost
SSL:                    Not in use
Current pager:          stdout
Using outfile:          ''
Using delimiter:        ;
Server:                 MariaDB
Server version:         10.11.11-MariaDB MariaDB Server
Protocol version:       10
Connection:             Localhost via UNIX socket
Server characterset:    latin1
Db characterset:        latin1
Client characterset:    utf8mb3
Conn. characterset:     utf8mb3
UNIX socket:            /var/lib/mysql/mysql.sock
Uptime:                 3 min 33 sec

Threads: 1  Questions: 25  Slow queries: 0  Opens: 20  Open tables: 13  Queries per second avg: 0.117
-----

MariaDB [(none)]>
```

Рис. 5: SQL-команды и базы данных

Настройка кодировки



The image shows a terminal window with a light gray title bar containing an 'Open' button, a dropdown arrow, and a plus icon. The terminal output displays the status of MariaDB components. Line 1 shows '[client]', line 2 shows 'default-character-set = utf8', line 3 shows '[mysqld]', and line 4 shows 'character-set-server = utf8'. The line containing 'character-set-server = utf8' is highlighted with a light gray background.

```
1 [client]
2 default-character-set = utf8
3 [mysqld]
4 character-set-server = utf8
```

Рис. 6: Статус MariaDB

Конфигурация utf8

```
MariaDB [(none)]> CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> USE addressbook;
Database changed
MariaDB [addressbook]> SHOW TABLES;
Empty set (0.000 sec)

MariaDB [addressbook]> CREATE TABLE city(name VARCHAR(40), city Varchar(40));
Query OK, 0 rows affected (0.008 sec)

MariaDB [addressbook]> INSERT INTO city(name, city) Values ('Иванов', 'Москва');
Query OK, 1 row affected (0.004 sec)

MariaDB [addressbook]> INSERT INTO city(name, city) Values ('Петров', 'Сочи');
Query OK, 1 row affected (0.001 sec)

MariaDB [addressbook]> INSERT INTO city(name, city) Values ('Сидоров', 'Дубна');
Query OK, 1 row affected (0.001 sec)

MariaDB [addressbook]> SELECT * FROM city;
+-----+-----+
| name      | city      |
+-----+-----+
| Иванов    | Москва    |
| Петров    | Сочи      |
| Сидоров   | Дубна     |
+-----+-----+
3 rows in set (0.000 sec)

MariaDB [addressbook]> █
```

Работа с базой данных addressbook

Создание базы данных и структуры

```
MariaDB [addressbook]> CREATE USER dgavdadaev@'%' IDENTIFIED BY '123456';
Query OK, 0 rows affected (0.002 sec)

MariaDB [addressbook]> GRANT SELECT,INSERT,UPDATE,DELETE ON addressbook.* TO dgavdadaev@'%';
Query OK, 0 rows affected (0.002 sec)

MariaDB [addressbook]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)

MariaDB [addressbook]> DESCRIBE city;
+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| name  | varchar(40)   | YES  |     | NULL    |       |
| city  | varchar(40)   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+
2 rows in set (0.001 sec)

MariaDB [addressbook]> █
```

Рис. 8: Создание базы и таблицы

```
[root@server.dgavdadaev.net my.cnf.d]#  
[root@server.dgavdadaev.net my.cnf.d]# mysqlshow -u root -p  
Enter password:  
+-----+  
|      Databases      |  
+-----+  
| addressbook         |  
| information_schema  |  
| mysql               |  
| performance_schema  |  
| sys                 |  
+-----+  
[root@server.dgavdadaev.net my.cnf.d]#  
[root@server.dgavdadaev.net my.cnf.d]# mysqlshow -u dgavdadaev -p addressbook  
Enter password:  
Database: addressbook  
+-----+  
| Tables |  
+-----+  
| city   |  
+-----+  
[root@server.dgavdadaev.net my.cnf.d]# █
```

Рис. 9: Записи в таблице

Управление пользователями и правами

Создание пользователя и назначение привилегий

```
[root@server.dgavdadaev.net ~]# cd /var/backup
[root@server.dgavdadaev.net ~]# mkdir -p /var/backup
[root@server.dgavdadaev.net ~]# mysqldump -u root -p addressbook > /var/backup/addressbook.sql
Enter password:
[root@server.dgavdadaev.net ~]# cd /var/backup/
[root@server.dgavdadaev.net ~]# mysqldump -u root -p addressbook | gzip > addressbook.sql.gz
Enter password:
[root@server.dgavdadaev.net ~]# mysqldump -u root -p addressbook | gzip > $(date +%Y%m%d.%H%M%S).sql.gz
Enter password:
[root@server.dgavdadaev.net ~]# ls
addressbook.20251128.094104.sql.gz  addressbook.sql  addressbook.sql.gz
[root@server.dgavdadaev.net ~]# mysql -u root -p addressbook < addressbook.sql
Enter password:
[root@server.dgavdadaev.net ~]# zcat addressbook.sql.gz | mysql -u root -p addressbook
Enter password:
[root@server.dgavdadaev.net ~]#
```

Рис. 10: Пользователь и права

Резервное копирование и восстановление

```
[root@server.dgavdadaev.net backup]#  
[root@server.dgavdadaev.net backup]# cd /vagrant/provision/server/  
[root@server.dgavdadaev.net server]# mkdir -p /vagrant/provision/server/mysql/etc/my.cnf.d  
[root@server.dgavdadaev.net server]# mkdir -p /vagrant/provision/server/mysql/var/backup  
[root@server.dgavdadaev.net server]# cp -R /etc/my.cnf.d/utf8.cnf /vagrant/provision/server/mysql/etc/my.cnf.d  
[root@server.dgavdadaev.net server]# cp -R /var/backup/* /vagrant/provision/server/mysql/var/backup  
[root@server.dgavdadaev.net server]# touch mysql.sh  
[root@server.dgavdadaev.net server]# █
```

Рис. 11: Резервное копирование

Подготовка окружения Vagrant

Перенос конфигурации и данных

```
1  #!/bin/bash
2  echo "Provisioning script $0"
3  systemctl restart named
4  echo "Install needed packages"
5  dnf -y install mariadb mariadb-server
6  echo "Copy configuration files"
7  cp -R /vagrant/provision/server/mysql/etc/* /etc
8  mkdir -p /var/backup
9  cp -R /vagrant/provision/server/mysql/var/backup/* /var/backup
10 echo "Start mysql service"
11 systemctl enable mariadb
12 systemctl start mariadb
13 if [[ ! -d /var/lib/mysql/mysql ]]
14 then
15     echo "Securing mariadb"
16     mysql_secure_installation <<EOF
17     Y
18     123456
19     123456
20     Y
21     Y
22     Y
23     Y
24     EOF
25     echo "Create database"
26     mysql -u root -p123456 <<EOF
27     CREATE DATABASE addressbook CHARACTER SET utf8 COLLATE utf8_general_ci;
28     EOF
29     mysql -u root -p123456 addressbook < /var/backup/addressbook.sql
30 fi
```

Итоги

MariaDB успешно установлена и сконфигурирована. Созданы база данных **addressbook**, таблица **city**, пользователь и права доступа. Выполнено резервное копирование и восстановление БД. Конфигурации и резервные копии интегрированы в инфраструктуру Vagrant, что обеспечивает автоматизацию развёртывания среды.